DOCUMENT RESUME

ED 159 914 FL 009 764

AUTHOR von Raffler-Engel, Walburga; And Others
TITLE Verbal and Nonverbal Student Interaction in the College Classroom as a Function of Group Cohesion.
PUB DATE Sep 78
NOTE 29p.; Paper presented at the World Conference of Sociology (9th, Uppsala, Sweden, August 14-19, 1978)

EDRS PRICE MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS Behavior Change; Body Image; *Body Language; *Classroom Communication; College Students; Communication (Thought Transfer); Group Dynamics; *Group Relations; Group Unity; Higher Education; Human Posture; *Interaction Process Analysis; Intercommunication; Interpersonal Relationship; Language Research; *Nonverbal Communication; *Paralinguistics; Personality; Psycholinguistics; Sociolinguistics; Student Teacher Relationship; Verbal Communication

ABSTRACT

The correlation of verbal, paralinguistic, and kinesic features in the context of student-student and student-teacher interaction is studied in a semester linguistics course at Vanderbilt University. The purpose of the research is to delineate some of the major problems of group interaction in the college classroom and to show how the various factors affecting it are related to personality factors. Three sets of structure determine interactional behavior in the group: (1) the pre-existing culture norms which form the shared pre-suppositions; (2) the group cohesion rules that are solely dependent on the constituency and the setting of the group (which change in function of time and through eventual variation in group composition); and (3) the behavioral rules that relate to external factors. The influence of external factors appears to be consistent and predictable and can, therefore, be structurally categorized eventually. The findings have led to the conclusion that there is a direct causal relationship between familiarity/formality and the degree of gesticulation. Nonverbal behavior has a substantive part in forming and sustaining the interactional processes among participants. Chart and graph data are appended. (Author/NCR)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED159914

(c) Walburga von Raffler-Engel 1978

Verbal and nonverbal student interaction in the college classroom as a function of group cohesion

Walburga von Raffler-Engel, Bruce Bennett, Diana Donnelley, Thomas Faulconer, Howard Freiman, Joseph Herzog, Barbara Johnson, Gregory Puckett, Lucy Richardson, Leonard Silverstein, Martha Stewart, Betsy van Vleck
(Vanderbilt University)

Introduction

A research grant from the Kenan-Venture Fund enabled this principal investigator to research the correlation of verbal, paralinguistic, and kinesic features in the context of student-student and student-teacher interaction. At the conclusion of the research a travel grant from the International Sociological Association enabled the principal investigator to present her findings at the IXth World Congress of Sociology in Uppsala, Sweden, August, 1978.

Subjects were 12 undergraduates (7M and 5F) in a regular semester course in Linguistics at Vanderbilt University taught by the investigator (F). All subjects were white and came from diverse socio-economic backgrounds, but mainly from the middle and upper middle classes. The behavior of these 12 subjects was videotaped continuously from the beginning of the first meeting to the end of the last class.

The instructor-investigator structured the course on the informal level of teaching style. This allowed students to interrupt the lecture when they needed to ask a question or wished to volunteer a comment. The seating arrangement was in a semicircle with the professor at the right end of the semicircle. The camera was posited at a considerable distance on the opposite side of the classroom. The operator was largely hidden from sight.

The fact that our research extends over several months and that the setting was as naturalistic as possible, hopefully, obviates some of the pitfalls of some previous research in nonverbal interactional behavior (Argyle 1969) has shown that head nods have a different meaning under

FL009764

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Walburga von Raffler-Engel
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

laboratory and under
/field conditions. We believe that our experimental setting is virtually like a field situation. As time went by, most subjects forgot that they were being taped; none really cared much about the matter to begin with. In the classroom setting students are under observation by the professor who assesses their performance as a natural condition of the setting, even when they are not being taped. The professor had been videotaped before and was indifferent to it. In addition, everybody was able to view the tapes any time and could eventually request the deletion of some parts. Nobody availed himself of this privilege.

In recent times a number of books and articles concerned with the study of classroom discourse have appeared. These works provide a linguistic analysis of the face-to-face interaction between an individual student and the teacher. The focus is on the verbal exchange in a consecutive series of dyadic interactions. The present paper departs from this procedure in two ways. For one, its main concern is the nonverbal, rather than the verbal, behavior of the participants. Secondly, besides its focus on a different communicative modality, the methodological conception underlying our research of the interaction is not one of dyad interaction. We are interested in group dynamics, how a group functions as a whole and how its members relate nonverbally to each other. Out of this study a new model of communicative interaction emerged. The student group does not fit the usual linguistic model because it is not dyadic and it does not fit the usual anthropological model because it is not hierarchically structured. No social hierarchy obtains among undergraduates in the classroom setting.

The rules for the interaction between the professor and a student in the college classroom are well defined on the verbal and on the nonverbal level. They vary, of course, depending on the teaching style: formal lecture, informal lecture, or seminar; but they are all conventionally established. Student-to-student

behavior is not overtly codified, but abides by equally well known albeit tacit rules. It is these rules in particular which our video project made explicit. Sacks et al (1974:699) distinguish between context-free and context-sensitive rules. By context-free rules they mean universal rules for human interaction, while context-sensitive rules refer to the interactional system which is specific to a certain social situation. The rules which we describe are sub-context-sensitive. They obtain in the subsetting of a particular type of didactic discourse. The participants know the context-sensitive rules, but are acquiring the sub-context-sensitive rules as they go along. Partly these sub-context-sensitive rules are pre-existent and known to many of the participants, but partly these rules are determined as a consequence of the group itself. They unfold as the group develops and will be termed rules of group-cohesion later in this paper.

Analysis

All the students registered for the course through the customary procedures without prior knowledge that they would be videotaped. The first day of classes they came into the room singly or in small groups and took a seat according to preference and availability. The chairs had been arranged in a variation of the horseshoe, a semicircle with the professor (P) seated at the left end, all other chairs being vacant. Eventually the following seating arrangement materialized (see Fig. 1).

The students were then asked by the professor whether they had any objections to being videotaped for permanent record and all agreed without reservations. Subsequently the students were told that part of the course requirements would consist of a term paper presenting a partial analysis of these tapes. Each student or group of two students then selected a specific topic from among the following: verbal discourse, intonation contours, movements of the facial

muscles, head movements, posture, position and movements of the legs, and gesticulation by hands and arms. One student selected eye movements, but did not finish his task.

In order to reduce the time element in the tape evaluation, after each class session, a working tape was prepared from the master tape on which the straight lecture parts by the professor and the visiting lecturers were edited out, leaving only the overtly interactional sections. The results of the cumulative effort of the whole class brought about the following findings.

Undergraduate students are primarily concerned with the impression they make on their peers. After all, they associate with other students all the time and over a period of several years while they may have dealings with the professor only once in their lifetime, 3 hours a week during one semester. Naturally, students are concerned about their grade, but they realize that what counts is their performance on tests and the term paper. Class participation was officially allocated 5% of the total grade. The students look directly at the professor only occasionally, when they are particularly interested in the subject matter and when they have great difficulty understanding an explanation of hers. Students always direct their eye gaze towards another student when he says something and in most instances sustain the gaze throughout his speaking turn. There was only one direct correlation between class participation and the final grade in the course. The one student who virtually never interacted failed the course. Among the students who received grades A, B, and C no direct correlation could be established between either frequency or intensity of verbal interaction

When preparing to take the speaker turn, particularly during the early part of the semester, a student would gaze around among his fellow students. He was obviously more concerned about them than about the professor. Eventually,

all students established a particular rapport with somebody in the group. M2 and M3 had purposely registered for the same course; they were friends, members of the same fraternity and liked to study together. They quite naturally sat next to each other. M6 and M7 were from the same home state and knew each other from before. Obviously, they too decided to sit next to each other. M1 came alone followed by F2, who sat next to him. It turned out that she was a "little sister" in his fraternity and she was glad to see a familiar face in the classroom. She sat next to him. F3 and F4 sat next to each other by accident. They had very little in common in background and interests, but started sitting closer and closer to each other, somewhat distancing themselves from M4 on the one side and M5 on the other.

In the group there thus emerged three sets of pairs, each forming a distinct subgroup. Very soon in the semester, a member of the subgroup tended primarily to gaze at his or her companion before speaking rather than at the whole group. When not sitting with their legs facing each other in the "book-ending" posture (Fast 1970), these paired students sat in an identical posture falling into kinesic synchrony.

F5 came in late and took the only seat that was left at the far right. Eventually she teamed up with P, shifting her body posture so that she would bookend with her across the room. In discussions she frequently gave additional examples supporting the point made by P.

F1 was the sister of a former student of P and sat next to her. F1 and P bookended when they interacted verbally, but in other situations did so only partially or not at all. When P was lecturing or interacting with other students, F1 bent her torso backwards in an apparent attempt not to come between P and the other students. Her leg position, however, frequently remained in the bookending position.

M5 found himself in a lonely situation, between the two girls on his right who had just formed their own subgroup and the two men from the same state on his left. He decided to face P, but in an opposing rather than a synchronizing posture. When speaking with a student P tended to lean forward; M5 spoke with erect torso. P's knees always touched while M5 tended to keep his legs slightly apart. M5 frequently argued the points made by P, citing counter examples. M5 and P formed what could be termed an accross-the-room-bookending position, interacting in a sharp, cordial and critical manner.

M4 sat in the center. At first he kept a body posture all of his own while taking an extremely active and independent part during discussion periods. After the third session he started more and more to synchronize his posture with M2 and M3. Eventually M4 had to withdraw from the course for health reasons and his subsequent behavior could therefore no longer be observed.

In summary, the group restructured itself into a series of dyadic subgroups. The primary factor in determining subgroup cohesion was familiarity, and the secondary factor was sex. This was the only instance where sex had a noticeable effect on the classroom behavior. There were other behavioral differences depending on sex, but these did not seem to affect the interactional pattern. All female students sat with their legs crossed virtually throughout the entire class session while male students crossed their legs only occasionally. Sitting with crossed legs is deemed proper behavior for girls in the American culture, but is not at all mandatory for men. The professor sat with both feet on the floor because in her original European culture that was considered the more proper seating position for women.

There was no significant sex difference in relation to facial mimicry. Frequency of facial expression was in direct correlation with frequency of verbal participation and unrelated to seating arrangement (see Fig. 2).

This was the conclusion reached when five randomly selected videotapes (the third, tenth, eleventh, fifteenth and twentieth class meeting) were evaluated in reference to the observable facial expressions categorized by Izard (1971). The four most commonly observed facial expressions were: interest, joy, shyness and boredom. The questioning face was deleted from our calculations because of its cluttering high frequency. It must be noted, incidentally, that in the classroom situation the questioning face is a sub-category of the expression of interest. The total number of observable facial expressions per person on the five tapes was recorded and divided by the number of tapes on which the person appeared, giving the quotient for gesticulation, which was used to compare the frequency for each individual's facial expression. Cumulative data for the class show that there is basically little, if any, difference of facial expression frequency due to sex. Discarding the highest and lowest ratios along with the biased ratio of the professor, there is only a fifteen-hundreths difference between the average of the six remaining males and four remaining females. (See Fig. 3). Dropping the high and low male ratios to obtain a five-on-five comparison of sex shows a nine-tenths difference in favor of the males having a higher facial expression frequency which is not statistically significant. Individually the highest ratio of facial expression belongs to a male while the lowest belongs to a female. With all individual scores included, the males have a slight comparative edge. The range of the data is 5.25 (1.5 to 6.75), the mean is 4.29, and the median is 3.75.

There was 100% inter-rater agreement among the participants in the course that the male students had more instances of verbal interventions and that on the average their interventions were longer than those of the female students and that this proportion would hold when adjusted to the 7:5 students sex ratio in favor of the males. This observation supports the findings of Eakins (1976),

the three sources quoted in her article, and others, that men talk more than women in spontaneous speech. It also seemed that the men had more, and more extensive, and wider ranging body motions than the women. The wider range is particularly due to the fact that under the influence of boredom male students tended to slouch their torso and their head backwards and push their legs forward until their feet would rest on the heels. Bored females kept their legs crossed while slouching their torso in a crumpled forward position with the head bent downwards. What, if any, the influence of a female professor is on the turn-taking behavior of same-sex and other-sex students cannot be assertained from these tapes alone. It may, nevertheless, be significative that the two unpaired female students (F1 and F5) formed a subgroup with P by supportive interaction while the unpaired male student (M5) formed a subgroup with her through argumentative interaction.

The more we viewed the videotapes the more it became apparent that the rules governing the multi-faceted interaction of people in a group are not quite the same as those governing the speaking turn system in face-to-face interaction in the dyad. Duncan and Fiske's (1977) excellent model for turn taking behavior in the dyad needs certain modifications to be made applicable to group communication. It also needs to be adopted to specific types of interactional relationships.

In the classroom situation more than one auditor may be viewing for floor apportionment at the same time, and not every auditor who wants to take the speaking turn has the attention of the current speaker at that precise moment. The professor may look at the students on the left when a student on the right wishes to speak. The student who wishes to speak must make a stronger effort at head nodding or shaking than if he were in a one-to-one situation. In our class students even made a slight noise with their waving

arm or even with their feet. In some instances students shifted their posture orientation towards the one who wanted to speak in order to draw the professor's gaze in his direction. The interactional rules between student and professor are non-reciprocal. The professor may abruptly take the speaker turn while the student must display the speaker-state signal. A classroom-specific rule requires that students raise their hand and wait for permission before they take the speaker turn.

Ordinarily, when a student wishes to speak he raises his arm. The professor has the choice of recognizing or ignoring the student's turn signal. When the professor recognizes the student he gives a verbal and/or nonverbal recognition signal. In our case, P almost always nodded with the head turned in the direction of the student and sometimes called the student by name. Upon receiving P's recognition signal, the student proceeded to put his arm back down into the resting position and started to speak. When a professor decides not to yield the speaking turn he does not necessarily have to give a speaker continuation signal, as would be customary in the dyad (Duncan 1974), he may simply continue talking as if nothing happened. In our sample, given the informal structure of the course, this was rarely, if ever, the case.

In the two dyadic interactions analyzed by Duncan (1974:172) not

less than 84 percent of auditor turn claims occurred in response to a speaker turn signal. In our sample the percentage is much lower. Student speaker turns, however, occurred at grammatically appropriate moments, as in the Duncan sample. During three randomly selected class meetings (the third, fourth and fifth sessions) there were 151 student speaking events. Of these 114 occurred in response to a speaker turn signal by the professor and 37 occurred without any previous signal. The percentage of auditor claims in response to a speaker turn is thus 75.59 percent. Taking Duncan's model, our null hypothesis, h o, is that 84 percent of the time a student speaks, the professor has given a turn signal. Our alternative hypothesis, h 1, is that a student will speak even if a turn signal is not given. Our data is as follows:

Students speak	Students speak, turn signal given	Students speak, no turn signal given
151	114	37
Expected times	.84 x 151 = 126.84	24.16

$$\chi^2 = \frac{(126.84 - 114)^2}{126.84} \times \frac{(37 - 24.16)^2}{24.16} = 8.12$$

At the 5.90 significance level, the critical value for the chi-squares test with one degree of freedom is 3.84. Since the chi-square is greater than the critical value, we can conclude that students will speak even when there are no signals given.

As the student is under pressure to make certain that he fully understands what the professor is saying he may feel more inclined to interrupt the latter than another auditor would in polite conversation. The total frequency of student speaking turns, and indeed the very possibility of students having a speaking turn depends on the manner in which the class is structured. In the

most formal of settings the correspondence between turn signal and responses may very well be up to 100 percent. The structure of interactional behavior is largely conditioned by the social co-structures. Interactants' behavior is constrained by factors that are pre-existing to the speech event (culture rules) and factors that co-occur synchronous with the event (group cohesion rules) (von Raffler-Engel, 1978). Frey (1975) has shown that body motions are not triggered simply by particular stimuli immediately preceding the movement, but as a consequence of a complex behavioral program. The conscious and unconscious awareness of the factors of group cohesion is part of this complex behavioral program. The evolving of group-cohesion rules as the semester progressed was evident on the tapes. During the earliest period of the semester a student would start raising his hand, and at the most, extend it further out or higher up. As the course progressed and the formality decreased, hands were waved with animation and even with vigor. By viewing the videotaped class sessions, we discovered an inverse relationship between formality and familiarity with respect to time. We found that as the formality of the classroom environment decreased, the familiarity among students increased. Therefore, as the semester progressed, the students became more familiar with one another and discarded their inhibitions. Communication among students and between students and the professor increased as a consequence. Hand movement increased in frequency and intensity. By the time the class received visiting lecturers, the familiarity among students had increased and the formality had decreased to such an extent that even the presence of formal visitors did not preclude gesticulation. Our findings have led us to the conclusion that there is a direct causal relationship between familiarity/formality and the degree of gesticulation.

Familiarity ↑, Formality ↓ ⟹ Verbal Communication ↑ ⇒ NVC ↑

⟹ Gesticulation ↑

Parallel to the increase in gesticulation was an increase in the range of prosodic articulation. To test this impression, we selected a random utterance by four students during the first class meeting and during a meeting two months later (see Fig. 5). During the early period of high formality and unfamiliarity, all subjects spoke almost in a monotone. In our sample sentences the pitch range never exceeded two points. This limited range is apparent even in a sentence with high relevance to the speaker, such as the one referring to the subject's going to be videotaped, "So you are just going to film people talking?" In the later period the pitch range may have the maximum four points of English (Trager and Smith 1951) even in such an unemotional phrase as "when the noun is the same as the verb." As one student commented by introspection, the increased familiarity with the surroundings makes the speaker feel more comfortable in expressing himself with fewer inhibitions.

On the segmental level, the interaction among the participants, especially the student-student interaction, increased in intensity as time went on. On the earliest tapes there were no instances of overlapping speaking turns. Such overlapping can be heard starting from the third class meeting. During the more formal setting with a visiting lecturer on the seventh meeting, no overlappings occurred either in student-student, student-professor or student-lecturer interaction.

Concerning the content of the student speaker turns, they can be divided into three categories: (1) requests for clarification, such as simple questions; (2) supplementations, that is comments and elaborations on what the professor

has just said; (3) solicited replies, like the answer to a direct question or to a general request for comments on the part of the professor.

In evaluating a section of twenty minutes in the middle of three edited tapes, it was possible to establish that these three categories are indeed three distinct units of utterance. A statistically significant difference in length of time obtains between these three categories (see Fig. 4). This calculation was based on ten minutes each, selected after the first five minutes had elapsed on the interactional parts of three randomly selected class meetings. It is possible that other meetings will yield different results, but from this limited sample, correlation between content and duration was so clear cut that we feel that our results can be considered indicative. They are as follows: (1) The student speaks briefly when he answers the most overt turn signal on the verbal and nonverbal level. He perfunctorily complies with the teacher's demand; (2) The student's request for clarification takes almost one-and-a-half as much time; (3) The bulk of the time is reserved for spontaneously offered comments. This third category not only lends itself naturally to a longer presentation because of its content; it is also the category which the student seemingly enjoys compared to the other rather dull categories.

In both the first and the second category the student self-selects his speaking turn. Considered under the terms of the speech exchange system, these two categories are opposed to the third category. When the three categories are analyzed strictly for content, this division does not necessarily hold true. The student's reply in the third, speaker-selected turn may offer a comment or simply request further explanation. What makes the third category consistently short in duration is not its linguistic content, but its function within the interactional system. It would, however, be misleading to classify all the units of a speech exchange system only in terms of the system. The difference

in duration between the first and the second category is dependent on the difference in semantic content. No structure functions independent of its costructures (von Raffler-Engel, in press).

External factors also influence the nonverbal behavior of the group. This, as far as we can determine from the literature, has not received adequate attention in the past. In this study we were able to notice the impact of climate on nonverbal behavior.

The course took place in the spring semester of the academic year. The climatic changes which occurred between January and April had noticable effects on the amounts of the participants' hand movements. At the outset of the taping, the outside temperature hovered between twenty and thirty degrees Fahrenheit. Consequently, students came to class bundled in many layers of clothing. Once in class, students discarded their outerwear but still showed the effects of the cold weather. They were slow to respond and gesticulations were held to a minimum despite comfortable classroom temperatures. At this time, there were three main hand positions. The most prominent position occurred as a result of taking notes. Students were required to hold a notebook in one hand while simultaneously writing with the other. Because the note-taking students were occupied, limited gesticulations of the hands resulted. When not taking notes, the students' hand positions usually fell into one of two categories. Either the hands were in the lap on top of the notebook and clasped in some manner or the arms were folded across the chest with the hands being placed under the arms.

In the latter months of the semester when the temperatures were in the sixties and seventies Fahrenheit, a difference in hand positions was noticed. As with the colder climate, three basic hand positions were found. The first was a comparable note-taking position; however, the other two hand positions

differed distinctly. Instead of the hands being clasped on the lap, it was discovered that students still rested their hands on their laps, but now they were unclasped and lay freely. Furthermore, the students rarely folded their arms across their chest; instead they let their hands dangle freely from the arms of the chair when not taking notes. Thus, we found that during the winter months, the closed hand positions put a constraint upon the amount of gesticulations. In the spring months, however, the positions were noticably more open, which encouraged a greater use of hand communication.

In order to verify our impressions, we counted hand movements during five consecutive sessions on the master tape. The data was taken after 20 minutes of class time had elapsed and encompassed 10 minutes of the class period. Our results indicated that as spring approached and temperatures became warmer, the percentage of hand gestures per speaker turn increased.

To discount the increased familiarity variable, we analyzed the percentage of hand gestures per speaker turns on a cool day in April. As evident from our findings, the percentage decreased on that day, and on April 25, the number of speaker turns was unusually low. But, this may have been due to the professor's increased hand gesticulations yielding more speaker time (we did not, however, time her length of discourse in the 10 minute period). Our data also showed that the number of incidents of speech without hand gestures per number of student speaker turns decreased as the temperature became warmer. On April 11, 1978, the cooler temperature caused a greater percentage increase in speaking without hand gestures which correlated with the percentage decrease in hand gestures cited. (See Fig. 6).

Conclusion

The theoretical conclusions to be drawn from the present research in classroom behavior are as follows. Three sets of structures determine interactional behavior in the group: (1) The pre-existing culture norms which form the shared pre-suppositions. (2) The group cohesion rules which are solely dependent on the constituency and the setting of the group and which change in function of time and through eventual variations in group composition. (3) The behavioral rules which relate to external factors. The influence of external factors appears to be consistent and predictable and can, therefore, eventually be structurally categorized. Of course, all these three structures interact in a complex network of relationships.

The participants in the group and in the subgroups have internalized the rules and as Scheflen (1977) points out, "systems principles are in operation with retroaction, monitoring, regulation to maintain the group. A group is not seen as a collection of individual people, but as an integration of relationships, which can be further analyzed as integrations of behavioral units."

Dyadic and group interaction share many features, but there are also basic differences. Some of the latter are due to the physical differences given that face-to-face visibility in the group is more often than not established after the emission of the speaker turn signal. Whether this fact gives greater prominence to the auditory channel to the detriment of the visual channel remains to be investigated. The examination of the classroom interaction presented in this paper does not point in that direction. Nonverbal behavior had a substantive part in forming and sustaining the interactional processes among the participants.

Personality factors

Individual differences are frequently underrated in scholarly research which

does not deal specifically with personality factors. Our analysis points to the need for giving a much larger share to personality features than is customary.

After watching only a few tapes it became apparent that each student had his or her own habitual style of sitting in the classroom chair and that some people sit more quietly while others shift around and/or gesticulate more. M2 shifted position more than anyone else, but even though he moves around a lot, he is commonly found in one of two positions. In the first, his legs are crossed (mostly with the left leg on top) and he is leaning back in the chair. This second position is with both feet on the floor and slightly apart and sitting back in the chair.

The most important personality factor in interactional research is dominance. Some people are leaders, while others are kinesic followers. In the subgroup formed by M2 and M3, M2 was the leader. M2 moved very little and usually sat in what another student defined "a very confident position," with his legs crossed (with the right leg on top most of the time), and in an upright position or leaning back in the chair. As much as M3 moved around, he eventually synchronized his position with M2. In the three subgroups with P, F5 was a follower but of a type that could be called dominant following as she had an explicit purpose in supporting P and by this gained a certain amount of dominant position in the group as a whole, comparable to a second officer. M5 was a dominant personality and thrived at showing his intent not to be a meek absorber of what P had to say. He did very well on tests, wrote an excellent term paper and received the grade of A in the course. F1 was kinesically quiet, a shy personality, but an independent thinker. In her term paper she made use of reference material which had not been mentioned in class. She had superior test scores and her course grade was A. M5 and F1 , who were both

excellent students, manifested an extremely different interactional behavior. No direct relationship seems to obtain between dominance and intellectual power.

Postural synchrony was evident throughout the subgrcups, but [redacted] no correlation appeared between subgroup cohesion and absolute frequency of body motions. M7 leads in the M6-M7 subgroup. Interestingly, M7 was frequently influenced by the posture taken by M5 to begin with.

M1, leads in the M1-F2 subgroup. M1 was absent on several occasions. During those sessions F2 adjusted her posture to F1-F2, is definitely a follower. When F2 was absent M1 kept an independent posture. He is a leader. Neither M1 nor F2 had frequent shifts and both had a low gesticulation ratio. The relationship of kinesic activity and dominance cannot be ascertained from our sample.

In a classroom situation the teacher is obviously the dominant person, but given the atmosphere of cooperativeness, in our research project P was not the leader in kinesic synchrony. During the three more formal sessions with visiting lecturers, teacher dominance became occasionally, but by no means always, apparent. This is due to the fact that by that time the informal classroom setting had been firmly established.

Duncan (1974) has shown that increase in gesticulation is a speaker in-turn signal in the dyad. This does not seem to apply to its full extent in the classroom where, as said before, the teacher need not yield to the auditors' turn signals. In our sample P had the largest gesticulation ratio and there was inter-coder agreement that P gesticulates very heavily. Also in dyadic interaction with a student or a colleague, this is a personality factor of hers. We did not analyze the few instances where P denied a student speaker turn signal.

Postscript

Our analysis is not conclusive and a national grant application to complete the research is pending. We hope, nevertheless, that we have brought out some of the major problems of group interaction in the college classroom and how the various factors affecting it are related to personality features.

The prime factor which prompted student intervention was interest in the topic discussed at the moment. There was a clear correlation between the student's academic major and career goals and his speaking turns, as well as his shifts in posture and eye gaze.

REFERENCES

Argyle, Michael 1969
Social Interaction. London; Methuen, New York: Atherton

Eakins, Barbara 1976
"Verbal turn-taking and exchange in faculty dialogue," pp. 53-62 in Proceedings of the Conference on the Sociology of the Languages of American Women ed. by B. L. Dubois and I. Crouch. San Antonio, Texas: Trinity University.

Fast, Julius 1970
Body Language. New York & Philadelphia: Lippincott.

Frey, Siegfried 1975
"Tonic behavior in interaction," pp. 128-150 in Organization in face-to-face interaction," ed. by A. Kendon, R. M. Harris and M. R. Key. The Hague: Mouton (World Anthropology)

Izard, Carroll E. 1971
The face of emotion. New York: Appleton, Century, Crofts (Century Physiology Series).

Sacks, Harvey; Emanuel A. Schlegloff and Gail Jefferson 1974
"A simplest systematics for the organization of turn-taking for conversation," pp. 696-735 in Language 50/4.

Scheflen, Albert E. 1977
"Systems in human communication," pp. 3-39 in Aspects of nonverbal communication, ed. by W. von Raffler-Engel and B. Hoffer. San Antonio, Texas: Trinity University.

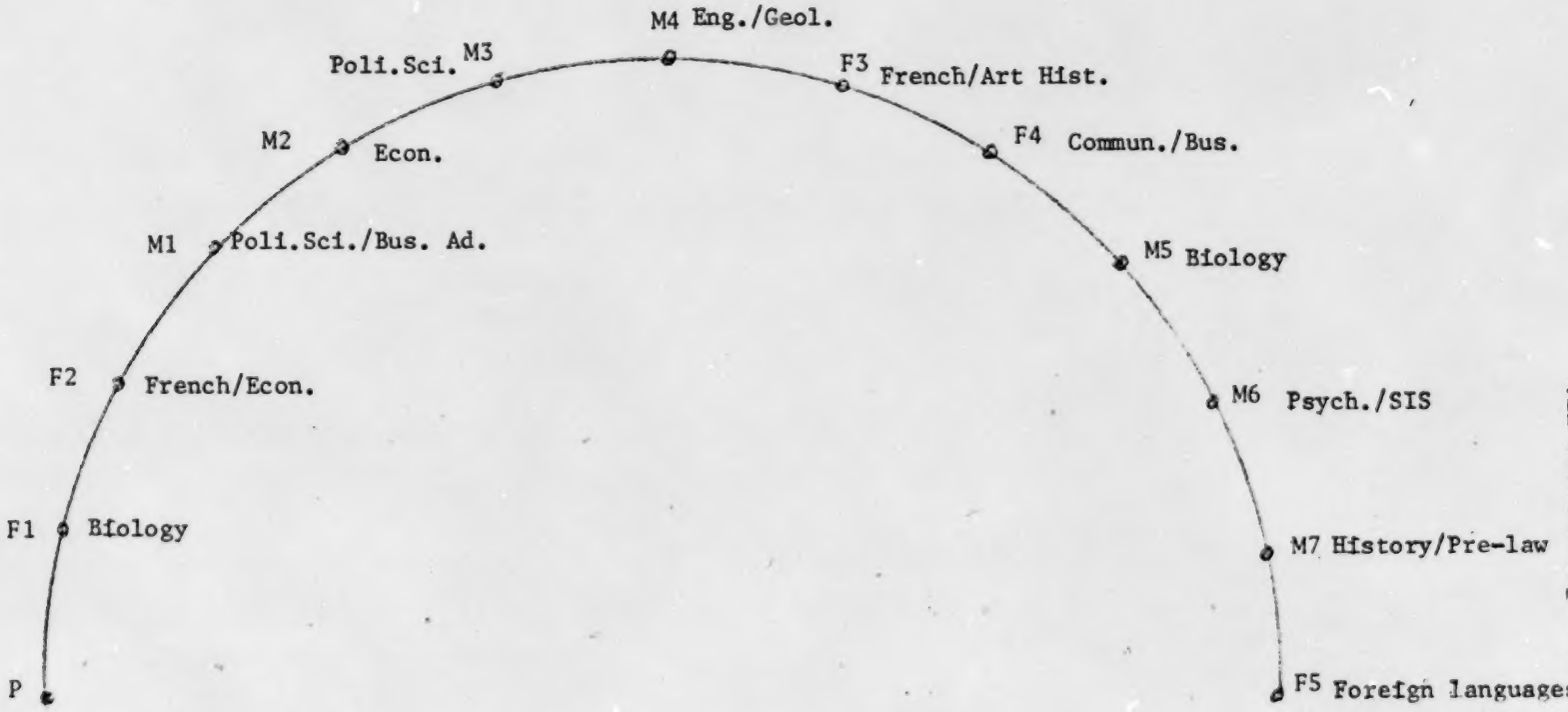
Trager, George L. and Henry Lee Smith 1951
An outline of English structure. Norman, Oklahoma: The Battenburg Press.

von Raffler-Engel, Walburga ~~(in press)~~ 1978
"On the structure of nonverbal behavior," pp. 000 in Man-Environment Systems 8, pp. 60-66.

Duncan, Starkey Jr. 1974
"On the structure of speaker-auditor interaction during speaker turns" p. 161-180 in Language in Society 2.

------ and Donald W. Fiske 1977
Face-to-face interaction; Hillsdale, N.J.: Lawrence Erlbaum.

Fig. 1--Seating Arrangement



Students are identified by number and according to sex. The professor is identified by P.

Fig. 2--Frequency of gesticulation in relation to seating arrangement.

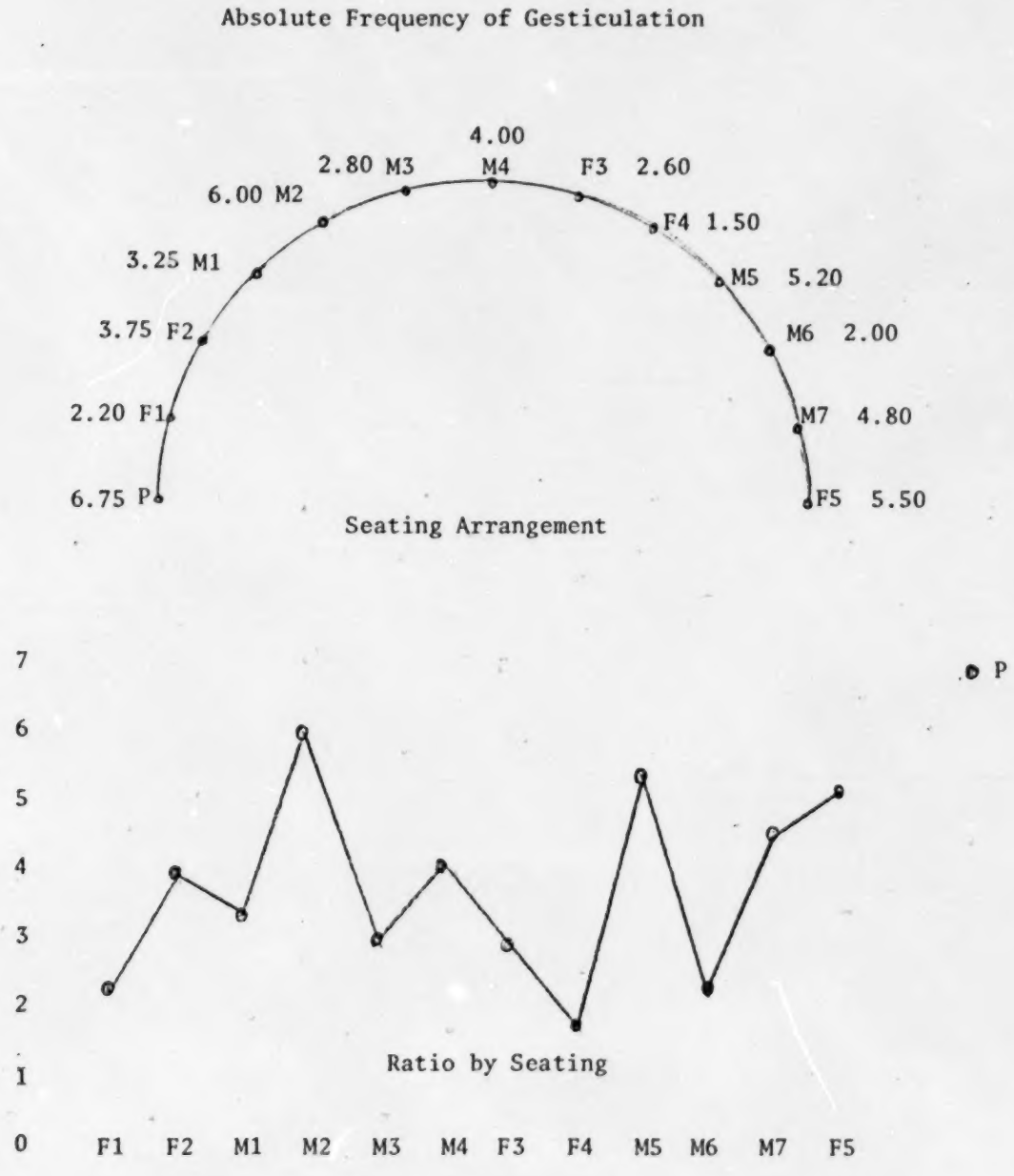


FIGURE 3

NAME	Number of Tapes	Number of Gestures	Ratio
Professor (F)	4	27	6.75
Female 1	5	11	2.20
Female 2	4	15	3.75
Male 1	4	13	3.25
Male 2	4	24	6.00
Male 3	5	14	2.80
Male 4	3	12	4.00
Female 3	5	13	2.60
Female 4	4	6	1.50
Male 5	5	26	5.20
Male 6	4	8	2.00
Male 7	5	24	4.80
Female 5	4	22	5.50

Composite data;

Seven males composite:	4.01	
Six males composite	3.68	(drop highest)
Six females composite:	3.49	
Five males composite:	4.01	(drop highest and lowest
Five females composite:	3.22	(drop professor)
Four females composite:	3.51	(drop professor and lowest)

Fig. 3--Content analysis of student interventions.

Data	Supplementation	Clarification	Solicited Reply
Mean amount of time spent by student talking	8.25	6.22	3.74
Variances of the sample	1.16	.85	.66
No. of samples	20	41	81

Note that the units of time is 1/100 of a minute. To convert to seconds multiply by .6.

Let X = supplementation
Y = clarification
Z = solicitation

Test #1. $H_o = w_x = w_y$ $H_1 = w_x > w_y$

We will use a student's T - test to see if the means are different.

$\bar{X} = 8.25$ $\bar{Y} = 6.22$ $n_x s_x^2 = 26.9$ $n_y s_y^2 = 29.6$

$$T = \frac{(\bar{X} - \bar{Y}) - w_x - w_y)}{\sqrt{n_x s_x^2 + n_y s_y^2}} \sqrt{\frac{n_x n_y (n_x + n_y - 2)}{n_x + n_y}}$$

$$= \frac{8.25 - 6.22 - 0}{\sqrt{26.9 + 29.6}} \sqrt{\frac{20.41 (59)}{61}}$$

$$= 7.61$$

With 59 degrees of freedom at the .5% significance level the critical value of the T distribution is 2.67. Since T is greater than the critical value, we reject the null hypothesis and conclude that the two means are different.

Test #2. $H_o: w_y = w_z$ $H_1: w_y > w_z$

$\bar{Y} = 6.22$ $Z = 3.74$ $n_y s_y^2 = 29.6$ $n_z s_z^2 = 35.3$

$$T = \frac{6.22 - 3.74}{\sqrt{35.3 + 29.6}} \sqrt{\frac{41 \cdot 81 \cdot 120}{122}} = 17.6$$

With 120 degrees of freedom at the .5% significance level the critical value is 2.61. Since T is greater than the critical value we reject the null hypothesis and conclude that clarification mean is greater than the supplementation means. All timing was done by hand with a stopwatch. However, the T values were so much greater than the critical values, that this random error would have made a significant difference.

Figure 5

First Class Meeting

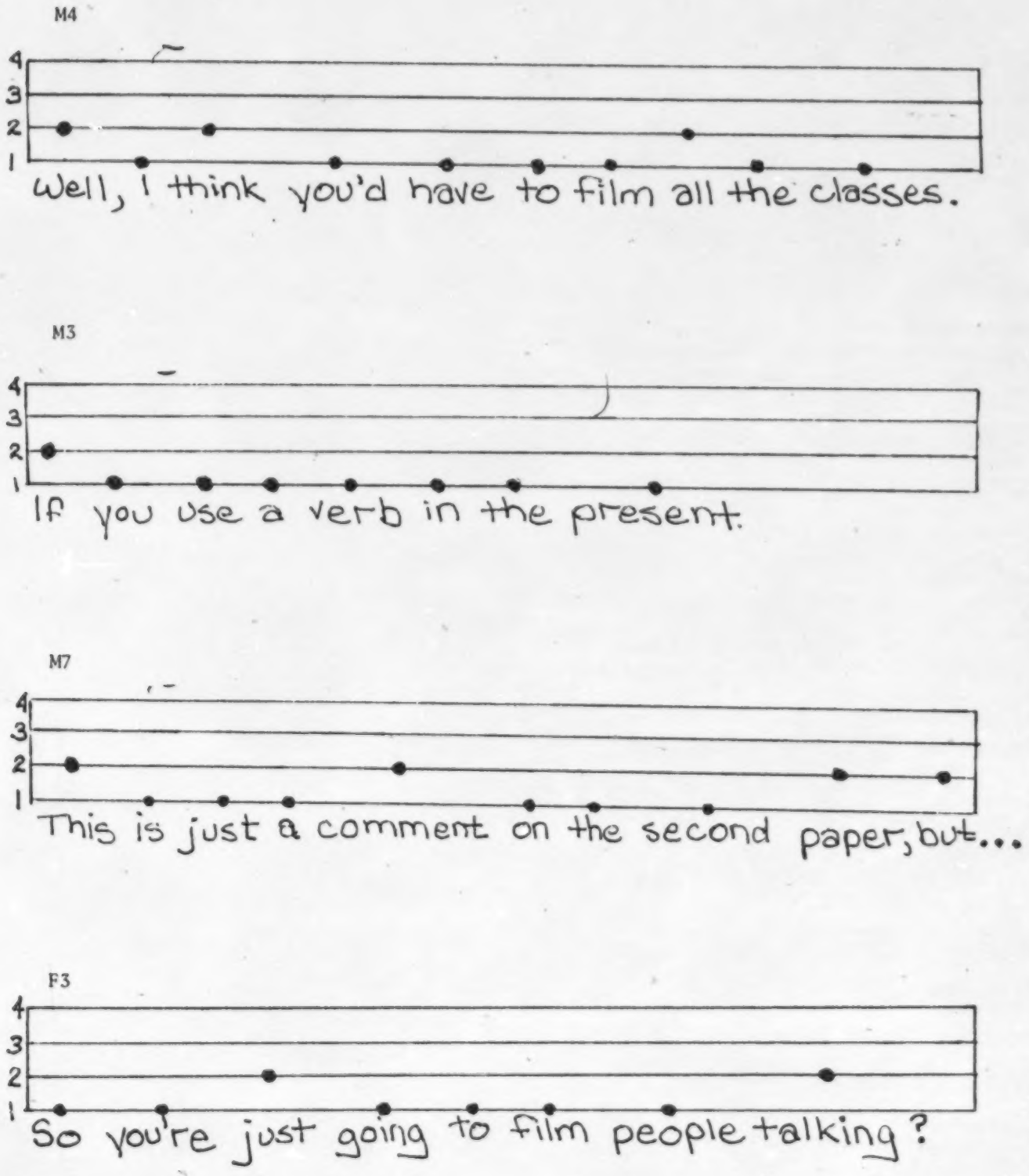
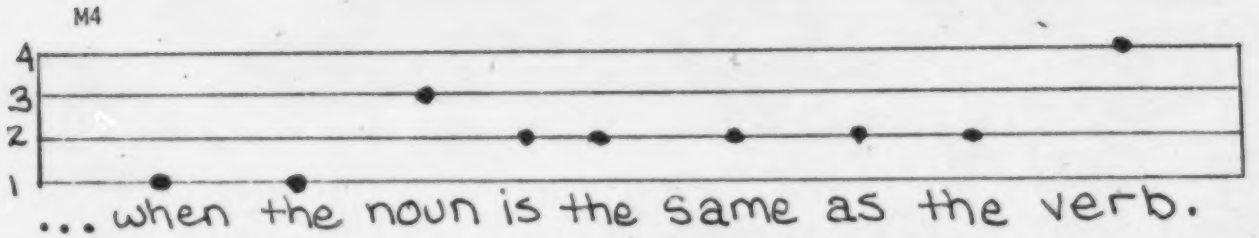
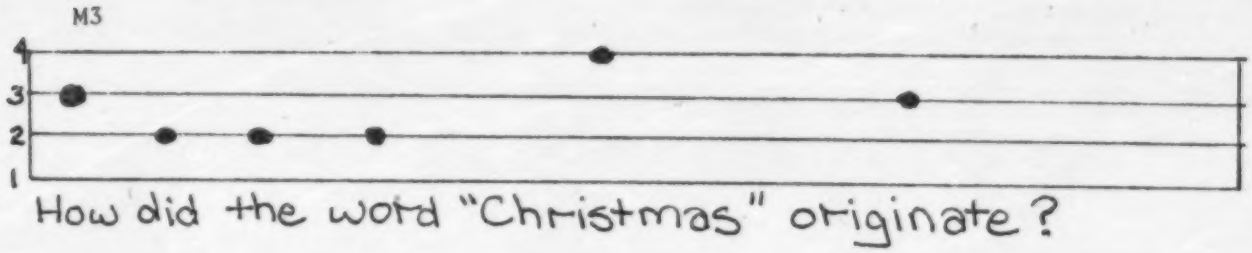
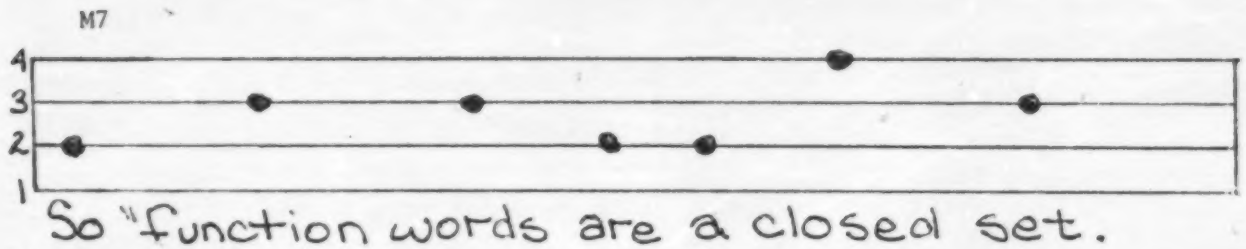



Figure 5--Continued.

Seventeenth Class Meeting







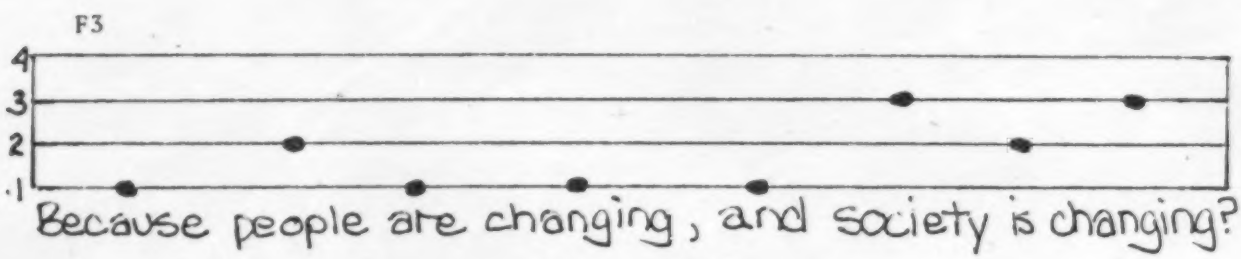


Fig. 6--Frequency of gesticulation in relation to climate.

Date	# of student speaker turns	# of incidents without hand gestures	# of incidents with hand gestures	# of speaking without gestures	# of gestures without speaking
1-24-78	3	4 (1:1.3)	3 (1:1)	1	18
2-23-78	11	11 (1:1)	13 (1:1.18)	0	24
3-21-78	13	14 (1:1.077)	17 (1:1.308)	1	28
4-25-78	2	0	7 (1:3.5)	1	31
4-11-78	4	9 (1:2.25)	6 (1:1.15)	1	24